1. Amendments to the Claims:

A clean version of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121(c)(3). This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) An image data processing method of automatic adaptation of 3-D surface Model to image features, for Model-based image segmentation, the method comprising:

creating a deformable tubular mesh model for fitting a 3-D path based on a centerline of a 3-D tubular object of interest, the 3-D path comprising a set of ordered points defining a plurality of path segments, the mesh model having an initial radius and comprising a plurality of mesh segments corresponding to the plurality of path segments; and

automatically adapting a length of a mesh radius of each ~~path~~ mesh segment based on a radius of local curvature of the corresponding path segment~~, a distance between the ordered points defining the corresponding path segment,~~ and ~~a predefined input~~ the initial radius.

2. (Currently amended) The image processing method of claim 1, wherein creating the deformable tubular mesh model comprises:

creating a tubular structure for fitting the 3-D path~~, which substantially comprises a centerline of a 3-D tubular object of interest~~; and

mapping the ~~3-D deformable~~ tubular structure onto a 3-D surface of the tubular object of interest, which is represented in a gray level 3-D image.

3. (Currently amended) The image processing method of claim 1, further comprising:

computing ~~a~~ the 3-D path that corresponds to ~~a~~ the centerline of ~~a~~ the tubular object of interest and defining the path segments on the 3-D path;

creating an initial straight deformable cylindrical mesh model, of any kind of mesh, having a length along a longitudinal axis equal to a length of the 3-D path;

dividing the initial mesh model into segments of length corresponding to the path segments of the 3-D path; and

computing, for each mesh segment of the initial mesh model, a rigid-body transformation that transforms an initial direction of the mesh segment into a direction of the corresponding path segment of the 3-D path, and applying the transformation to corresponding vertices of the mesh segment.

4. (Previously Presented) The image processing method of claim 3, further comprising:

blending the rigid-body transformations of consecutive mesh segments.

5. (Previously Presented) The image processing method of claim 4, further comprising:

computing rotations for the rigid-body transformations of consecutive mesh segments,

wherein a linear interpolation is used between rotations of the consecutive mesh segments for blending the 3-D rigid body transformations to limit self-intersections between bent portions of the deformable tubular mesh model.

6. (Currently amended) The image processing method of claim 1, wherein automatically adapting a mesh radius comprises:

modulating the initial radius of the deformable tubular mesh model according to a local curvature of the 3-D path to limit self-intersections between bent portions of the deformable tubular mesh model.

7. (Previously Presented) The image processing method of claim 6, further comprising:

approximating the local curvature; and

applying a radius modulation technique comprising one of linear blending or bi-cubic spline interpolation from one radius to another.

8. (Previously Presented) The image processing method of claim 1, further comprising:

determining a 3-D rotation comprising computing a minimal 3-D rotation from an initial mesh direction to a target segment to minimize mesh torsion.

9. (Previously Presented) The image processing method of claim 8, wherein determining the 3-D rotation further comprises:

defining rotation between segments using an axis parameter and a rotation angle parameter; and

computing the parameters iteratively between adjacent segments so that a new rotation for a current segment comprises a composition of a found rotation for a previous segment and the minimal rotation from the previous segment to the current segment.

10. (Previously Presented) A medical viewing system comprising:

means for acquiring 3-D medical image data of a 3-D object of interest having substantially tubular parts;

a suitably programmed computer or a special purpose processor having circuit means arranged to process the image data according to the method as claimed in claim 1; and

display means to display the medical images.

11. (Previously Presented) A medical examination apparatus comprising:

means to acquire a three-dimensional image of an organ of a body, the organ having substantially tubular parts; and

a medical viewing system according to claim 10.

12. (Canceled)

13. (Previously Presented) The image processing method of claim 2, wherein the deformable tubular model is created with one of 2-simplex meshes or triangular meshes.

14. (Currently amended) A method of automatically adapting a three-dimensional surface model of a substantially tubular object, the method comprising:

determining a three-dimensional path corresponding to a centerline of the tubular object;

defining a plurality of path segments on the three-dimensional path;

creating an initial straight deformable cylindrical mesh model having a length equal to a length of the three-dimensional path;

dividing the initial mesh model into a plurality of mesh segments corresponding to the plurality path segments;

computing a rigid-body transformation for each mesh segment for transforming an initial direction of each mesh segment into a path direction of the corresponding path segment;

applying the rigid-body transformation for each mesh segment to corresponding vertices of the mesh segment; and

adapting a mesh radius of each mesh segment based on at least a radius of curvature and a length of the corresponding path segment.

15. (Previously Presented) The method of claim 14, further comprising:

performing linear blending on the rigid-body transformations of consecutive mesh segments.

16. (Previously Presented) The method of claim 14, wherein adapting the mesh radius of each mesh segment comprises reducing a diameter of the deformable cylindrical mesh model in highly curved portions of the three-dimensional path.

17. (Currently amended) A computer readable medium for storing a computer program executable to process data for automatic adaptation of a three-dimensional surface model to image features, the computer readable medium comprising:

a mesh model code segment for creating a deformable tubular mesh model for fitting a three-dimensional path based on a centerline of a 3-D tubular object of interest, the three-dimensional path comprising a set of ordered points defining a plurality of path segments, the mesh model having an initial radius and comprising a plurality of mesh segments corresponding to the plurality of path segments; and

a radius adapting code segment for automatically adapting a length of a mesh radius of each ~~path~~ mesh segment based on a radius of local curvature of the corresponding path segment~~, a distance between the ordered points defining the corresponding path segment,~~ and ~~a predefined input~~ the initial radius.